On a new Form of the Differential Thermometer, with some of its Applications. *By* William Ritchie, *A.M. Rector of Tain Academy. Communicated by* J. F. W. Herschel, *Esq. Sec. R.S.* Read December 21, 1826. [*Phil. Trans.* 1827, *p.* 129.]

The instrument described by Mr. Ritchie in this paper, consists of two hollow cylinders of tin-plate, of large diameters in proportion to their height, placed with their bases parallel to each other, and at a moderate distance, and connected by a glass thermometer-tube, containing a coloured liquid, and in the form of an inverted syphon, after the manner of the photometer described by the same author in the Philosophical Transactions for last year. This instrument being placed between two sources of radiant heat, at such distances that the coloured liquid shall remain stationary in the tube, fixes the distances of equal radiation, from whence the radiations at equal distances may be calculated, supposing the law of the decrease of heat by radiation known, and *vice versâ*, supposing the ratio of the heats radiated at equal distances known, the law of radiation may be experimentally investigated.

As instances of the application of this instrument to experimental purposes, the author relates several experiments on iron balls, equally heated, and exposed at such distances as to subtend equal apparent diameters at the faces of the cylinders. From these he concludes that the law of the decrease of heat, as the inverse squares of the distances, is founded in fact. When, however, the heated bodies exposed had flat surfaces corresponding to those of the surfaces of the cylinders, he found a less rapid law of decrease to hold good; from which he concludes, that a constant portion of heat is radiated directly out from the surface without divergence, because an equal quantity, added to both terms of a ratio of greater inequality, as is well known, diminishes the ratio.

On the Structure and Use of the Submaxillary Odoriferous Gland in the Genus Crocodilus. *By* Thomas Bell, *Esq. F.L.S. G.S. Communicated by Sir* Everard Home, *Bart. V.P.R.S.* Read March 1, 1827. [*Phil. Trans.* 1827, *p.* 132.]

The author begins by remarking on the general inattention prevailing among anatomists, to such glands as produce anomalous secretions, required only by the peculiar and exclusive habits of the animals possessing them. A gland of this kind subsists beneath the lower jaw of the alligator and crocodile. It is situated on each side, and secretes an unctuous substance of a strong musky odour. Neither its structure nor its probable object have yet been considered with any care, till the author, about two years ago, discovered in it a structure which he thinks is without a parallel in the glandular system of other animals. His observations were made on the common alligator of America. In this animal the external orifice of the gland is situated